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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,927	09/29/2005	Andrew James Seeley	M02B149	1875

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EXAMINER	
PRASAD, NEIL	

ART UNIT	PAPER NUMBER
2822	

MAIL DATE	DELIVERY MODE
02/21/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/524,927	SEELEY ET AL.	
	Examiner	Art Unit	
	NEIL PRASAD	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 14-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 14-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/30/2006; 2/17/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-9, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teru et al. (US Patent No. 6,331,281) in view of Fuderer (US Patent No. 4,553,981).

Regarding claim 1, Teru discloses a process for utilization of an ammonia-containing waste gas stream from a semiconductor processing step, comprising:

- Decomposing ammonia contained in the waste gas stream into hydrogen and nitrogen (col. 16, lines 10-14)

Teru does not specifically disclose purifying the separated hydrogen in a purifier. However, Fuderer discloses purifying the separated hydrogen gas in a purifier (col. 1, lines 54-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Teru's step of decomposing ammonia into hydrogen and nitrogen with Fuderer's purification of the hydrogen because the high levels of purified hydrogen optimizes the gas stream (col. 1, lines 64-68).

Regarding the limitation of *using the purified hydrogen gas in a semiconductor process*, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reuse this purified hydrogen, since it has

been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416.

Regarding claim 3, Fuderer makes use of a pressure swing absorption system (col. 2, line 30).

Regarding claim 4, Teru discloses using palladium during the purification process (col. 6, lines 3-5).

Regarding claim 5, Teru discloses decomposition of the ammonia to occur with a hot catalyst (col. 6, lines 34-45).

Regarding claims 6 and 7, Fuderer discloses the hydrogen gas effluent to have a purity of at least 99% (col. 1, lines 59-61).

Regarding claim 8, Fuderer discloses purifying with use in other hydrogen-containing effluent gas streams (col. 1, lines 65-67).

Regarding claim 9, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reuse this purified hydrogen with further hydrogen in a semiconductor process, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416.

Regarding claim 19, Teru discloses an apparatus for manufacture of semiconductor products having a semiconductor processing device (Figure 1)

and a waste gas recovery loop (Figure 5), the waste gas recovery loop comprising an ammonia cracking device (3) that forms nitrogen and hydrogen.

Teru does not specifically disclose purifying the separated hydrogen in a purifier. However, Fuderer discloses purifying the separated hydrogen gas in a purifier (col. 1, lines 54-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Teru's step of decomposing ammonia into hydrogen and nitrogen with Fuderer's purification of the hydrogen because the high levels of purified hydrogen optimizes the gas stream (col. 1, lines 64-68).

Regarding the limitation of *using the purified hydrogen gas in a semiconductor process*, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reuse this purified hydrogen, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416.

3. Claims 2, 14-18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teru et al. (US Patent No. 6,331,281) and Fuderer (US Patent No. 4,553,981) as discussed in the rejection of claim 1 above, and further in view of Otsuka et al. (US Patent No. 6,749,819).

Regarding claim 2, Teru/Fuderer discloses the limitations as described in the rejection of claim 1 above. Teru/Fuderer does not disclose a processing step of gallium nitride epitaxy. However, Otsuka discloses purification for a gallium nitride compound semiconductor. It would have been obvious to use Otsuka's purification with

Teru/Fuderer's hydrogen because purified gases will provide a more effective device free from impurities.

Regarding claim 14, Fuderer makes use of a pressure swing absorption system (col. 2, line 30).

Regarding claim 15, Teru discloses using palladium during the purification process (col. 6, lines 3-5).

Regarding claim 16, Teru discloses decomposition of the ammonia to occur with a hot catalyst (col. 6, lines 34-45).

Regarding claim 17, Fuderer discloses purifying with use in other hydrogen-containing effluent gas streams (col. 1, lines 65-67).

Regarding claim 18, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reuse this purified hydrogen with further hydrogen in a semiconductor process, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416.

Regarding claim 20, Teru/Fuderer discloses the limitations as described in the rejection of claim 1 above. Teru/Fuderer does not disclose a processing step of gallium nitride epitaxy. However, Otsuka discloses purification for a gallium nitride compound semiconductor. It would have been obvious to use Otsuka's purification with Teru/Fuderer's hydrogen because purified gases will provide a more effective device free from impurities.

Regarding claim 21, Fuderer makes use of a pressure swing absorption system (col. 2, line 30).

Regarding claim 22, Teru discloses using palladium during the purification process (col. 6, lines 3-5).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pinto et al (US Patent No. 4,910,007). Pinto et al. (US Patent No. 4,910,007) discloses an ammonia synthesis gas.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NEIL PRASAD whose telephone number is (571)270-1430. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. P./
Examiner, Art Unit 2822

/Kevin M. Picardat/
Primary Examiner, Art Unit 2822